Deployable Multi-Channel SATCOM

By Lt. John P. Perkins, USN, Public Affairs Officer, Commander, Naval Special Warfare Group TWO

In an environment where information, intelligence, and communications shape the battlefield, United States Special Operations Command (USSOCOM) has developed, and is now testing a satellite system with the assistance of Naval Special Warfare Group 2 (NSWG-2) and two Army Special Forces units that will enhance Special Operations Forces (SOF) ability to execute special operations missions throughout the world.

U.S. Navy and Army Special Operations communicators-specialists pose in front of the Deployable Multi-Channel Satellite (DMCS) system Apr. 23, 2003. Developed by United States Special Operations Command, the Navy and Army Special Forces communicators are testing the new system. The DMCS will greatly enhance Special Operations Forces capabilities to deploy C4I combat support anywhere in the world. Official U.S. Navy photo by Lt. John Perkins.

NSWG-2, 112th Signal Battalion, 7th Special Forces Group, and USSOCOM Acquisitions and Logistics started a User Assessment Test (UAT) of the Deployable Multi-Channel Satellite (DMCS) system Apr. 10, 2003, at the NSWG-2 command building. This tri-band antenna is capable of transmitting and receiving in the X-, C- and Ku-bands at bandwidths of greater than 10Mbp. The UAT concluded with a final test at the NSWG-2 command building Apr. 22 and 23. The antenna has the newest design in satellite reception. "The DMCS will greatly enhance SOF capabilities to deploy with C4I [Command, Control, Communications, Computers and Intelligence] combat support anywhere in the world," said Senior Chief Electronics Technician Andrew Hale, NSWG-2 communications leading chief petty officer.

The new system, which is smaller and lighter than existing systems, can process information and data faster and handle greater bandwidth. Using the DMCS, the Mobile Communications Detachments that deploy with SEAL (SEa, Air, Land) Teams will be able to provide SEALs with more information and intelligence via unclassified and classified e-mail, telephone access, and Web browsing. This system provides a leap in technology over what the Mobile Communications Detachments have been able to provide previously. This significantly lessens the existing burden on other SOF commands that are currently providing vital C4I services to the deployed SOF warriors in the field.

"DMCS worldwide access puts information, intelligence, and communications at the warfighters' fingertips," said Hale. "We can provide these services in remote or deserted areas — anywhere in the world. It represents a great C4I advantage for the forces we support."

What makes the DMCS unique is its ability to transmit and receive data in three channel radio frequencies, and its unheralded capability to be reconfigured to transmit and receive data from one frequency to the other quickly and easily. Current systems can only receive and transmit the X- and C-bands and take hours to reconfigure the entire system between the two frequencies.

"This new system will make deploying Naval Special Warfare commands and SEAL Teams more independent and flexible in meeting the C4I needs of today's and tomorrow's Special Forces," said Hale.

CHIPS: How soon do you expect to deploy the DMCS in real combat?

ETCS Hale: The system is under test right now. We are going to have to wait for certification letters to come back from multiple agencies. Once that's done, we expect to have about another 60 days of testing. So we may be looking at August for deployment.

CHIPS: How much time and how many operators does the DMCS take to assemble? Do you need any other equipment to operate the DMCS?

ETCS Hale: By the operational requirements document, the ORD, there is a requirement for the system to be able to be constructed in 30 minutes by two operators. When we deploy forward, obviously we have to maintain battlefield quiet so we use big diesel generators. The gasoline driven generators we use in testing just provide the power we need to drive the antenna. We would have to use the 6500 because the antenna draws a lot of power. The average run of the mill generator doesn't cut it. You can't just plug that antenna into a wall socket.

CHIPS: What technical advancements led to the technology leap to make the DMCS capabilities possible?

ETCS Hale: We have broadened our SHF baseband signal and we have taken it out to an SHF level 4 IF [Intermediate Frequency] transmission. Currently that frequency transmission will handle everything at the SHF level. What we have done with this system is use an L-band intermediate frequency to handle everything going out. We bring in our baseband, we run it through commercial modems, and bring it up to an L-band IF and use that all the way out until we get to the final amplifier. The benefit is that it works in X-, C- and Ku-bands. We can use that L-band IF to work in all three of those frequency bands. So it gives us the ability to rapidly change out the components to reconfigure for another

band because we don't have to change everything to change that intermediate frequency. The other side is that we can remote (or remove) our baseband interface module within well over 200-feet for remote use of the antenna because we can use fiber optic at that L-band. We have a fiber optic interface and we can run it out remote that way.

CHIPS: How does the DMCS improve capabilities in the field?

ETCS Hale: It all gets down to bandwidth. The DMCS can pull in more bandwidth than we have ever had before. I can trunk in a T-1 without batting an eye, as long as my distance gives me that bandwidth. I can bring in a T-1 and set up a command and control facility for Special Operations Forces that is unparalleled to what we have ever been able to do in the past. That's more computers, more telephones, more secure lines, and VTC capability — anywhere, anytime.

CHIPS: What about imagery?

ETCS Hale: Absolutely, we can move higher resolution imagery at a faster rate but essentially we still get down to where we have 24 DS-0 (DS Zero) circuits. We have a T-1 or better so I can shove whatever I want into it — a high-resolution image, VTC or voice over IP (VoIP) capability with telephone systems — with quality of service at the very high end, extremely high-fidelity. We have echo canceling capability as well. The voice quality literally sounds like we are picking up from a telephone in your house.

CHIPS: Can ground forces using the DMCS communicate with the fleet?

ETCS Hale: Absolutely, once we tie back into our network operation support center, once we are the NOSC we have SIPRNET connectivity. We are in the SIPRNET, we can communicate via commercial telephone lines and the Defense Red Switch — and they [the fleet] can call us too.

We have a 2.4-meter dish made of composite material with easy construction. From that the beam gets focused down into the projector which is the piece sitting at the very front end of the dish. And that's one of the key components that we can change out rapidly — we can change out the projector from X- to C- or Ku-band. The beam comes back down through the waveguide into an amplifier. On the transmitter side the amplifier obviously is going out. On the receive side, it goes through a low noise amplifier back into the system. All that information is trunked down into what we call an antenna electronics case that is environmentally conditioned. It can handle humidity. It can handle rain. It can handle extreme cold. It has everything built into it, so that we can leave it out with the antenna system. From there, it goes through a down-converter, it's put on the fiber and brought into our baseband side.

The operators are put through some pretty intense training. To be a special warfare communicator you have to be able to work with radio equipment from ELF (Extremely Low Frequency) all the way up to EHF (Extremely High Frequency) and beyond. It takes a great deal of skill to be a special warfare support communicator. There is not much that these guys can't do. We put them through the ropes before we put them out in the field.

CHIPS: So all of the operators are capable of troubleshooting the equipment if it is not working the way it should?

ETCS Hale: Yes, they are troubleshooters, they are configurers, most

ETC Alan Willis operates the remote control panel that controls the satellite frequency for the DMCS.

of our Information Systems Technicians are network configuration types. A good number of our Electronic Technicians can do it too. They program routers and switches and build an IP structure. They know the operations side of the world as well as the RF portion and on top of that we require SOF people to be able to pick up any manpack radio and get on the horn and talk. In the same way, the Army folks who are supporting us have specialized training also. Special operations support and communications are critical — we only pick the very best. Those who don't quite make it, we will move on their way. We hold on to the best. These folks working on the DMCS are the stars of SOF.

Staff Sergeant Brown, USA, 112th Signal Battalion, Fort Bragg, N.C., said, *"This is a special piece of equipment. We can go in the middle of nowhere and provide local communications. I'm really ready to get out in the field and put it to the test."* Sergeant Treloar, USA, 7th Special Forces Group, Fort Bragg, N.C., said, *"This system provides us with a lot of capabilities that most Special Operations Forces have not worked with. It provides us with wide capabilities via telephones, Internet, SIPRNET, NIPRNET and more."*

DMCS Delivery

SPAWAR is responsible for Life Cycle Sustainment Management of the DMCS to include Configuration, Management, Logistics, Item Manager and Training. There will be 20 DMCS terminals issued as part of the first order with additional orders planned. The Psychological Operations (PSYOPS) program will be issued nine from the first order. CHIPS asked Frank Glover, team lead, Tampa Operations Center, SPAWAR Systems Center Charleston about SPAWAR support once the DMCS is deployed in the field.

Mr. Glover: If there is a faulty or missing component, they can call us and in CONUS, within 24 hours we will have a replacement to them, for OCONUS we can deliver within 48 hours. If there is a technical problem or an issue to be resolved, we will try to work the issue from here, but if they need on-site support — we will send a technician. We send technicians to various locations worldwide whenever it is required.

Some of the equipment will be continuously upgraded, but some is fairly stable. It depends on what portion, for example, the antenna, amplifiers and up- and down-converters are stable components. The baseband pieces, multiplexors, and routers will be upgraded because they will become obsolete fairly quickly. We will do technical insertions and software and firmware upgrades continuously.